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10/801,433	03/15/2004	Sheng-Shiou Yeh		3087

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EXAMINER	
DI GRAZIO, JEANNE A	

ART UNIT	PAPER NUMBER
2871	

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Please find below and/or attached an Office communication concerning this application or proceeding.

H1A

Office Action Summary	Application No.	Applicant(s)	
	10/801,433	YEH ET AL.	
	Examiner	Art Unit	
	Jeanne A. Di Grazio	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims

Claims 1-10 are pending with claims 1, 9 and 10 having been amended per Amendment of November 23, 2005.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Priority to Taiwan Patent Application 092105715 (March 14, 2003) is claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,285,424 B1 (to Yoshida)(as provided by Applicant) in view of United States Patent 6,740,457 B2 (to Takizawa).

As to claim 1 (amended), Yoshida has a black mask, color filter and liquid crystal display comprising in Figure 2, a transparent substrate (2), a black matrix (BM) having an anti-reflection layer (3 and 4) and a light shielding layer (screening film 5 which is made of chromium) successively formed on the transparent substrate (Column 8, Lines 27-32), the anti-reflection layer comprises a first anti-reflection film (3) and a second anti-reflection film (4) *formed on the first antireflection film* and having a different second index of refraction, *the first index of refraction being less than the second index of refraction* and a color resin layer (R, G, B).

The first and second anti-reflection films are made of different materials (See Abstract, for example) and thus the films have different indices of refraction.

Please also note that Yoshida teaches: "Consequently, a first antireflection film 3 (that film closer to the transparent substrate side) with a film thickness of 60 nm containing a chromium oxide, chromium nitride, chromium carbide, chromium oxide nitride, chromium oxide carbide, chromium nitride carbide, or chromium oxide nitride carbide was directly formed on the substrate." (Comparative Example, Column 14, Lines 35-67).

Yoshida further states: "Consequently, a second antireflection film 4 with a film thickness of 40 nm containing a chromium oxide, chromium nitride, chromium carbide, chromium oxide nitride, chromium oxide carbide, chromium nitride carbide, or chromium oxide nitride carbide was formed on the first antireflection film 3." (Id.).

Chromium oxide has a smaller index of refraction than that of chromium nitride, for example.

Yoshida teaches that the above antireflection films, in addition to improved contrast, also result in " ... a black mask having reflective characteristics largely exceeding the reflective characteristics of conventional black masks, having small wavelength dependence of the reflectivity overall the visible wavelength range, and being good in its etching characteristics, and a color filter and a liquid crystal display which can provide clear pictures." (Column 16, Lines 1-15).

The black matrix of Yoshida also appears to have apertures and the apertures are filled with the color resin layer as shown in Figure 2.

Yoshida, however, does not appear to explicitly that the color resin layer covers the black matrix entirely.

Takizawa teaches and discloses a color filter substrate and associated method and shows in reference to Figure 1, reflective light-shielding layers (212B) with apertures, red (213r) and blue (213b) resin layers that completely cover the light shielding layers (212B) and blue and green resin layers (213b and 213g) that are stacked above the light shielding layers (212B). Thus, at least one color totally covers the light shielding layers.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Yoshida in view of Takizawa to sufficiently shield light and to prevent degradation of visibility due to light reflected at the light-shielding layers (Column 9, Lines 48-64).

Thus, claim 1 is rejected.

As to claim 2, the antireflection layer (3 and 4) and light shielding layer (5) are made of chromium and or chromium-based compounds (See Table 1 of Yoshida, for example).

Thus, claim 2 is rejected.

As to claim 3, the color resin layer is of red, green and blue resins (Yoshida) as noted and seen in Figure 2.

Thus, claim 3 is rejected.

As to claim 4, the RGB resins fill each three contiguous apertures respectively (See Figure 2 of Yoshida).

Thus, claim 4 is rejected.

As to claims 5-8, the resin layers and resin stacks cover corresponding portions of the light shielding layers and are lapped on the layer and entirely cover the light shielding layer as can be seen Takizawa Figure 1, for example.

Thus, claims 5-8 are rejected.

As to claim 9 (amended), Yoshida has a black mask, color filter and liquid crystal display comprising in Figure 3, a TFT substrate (20) joined onto the transparent electrode (7) of the color filter substrate (1), and in Figure 2, a transparent substrate (2), a black matrix (BM) having an anti-reflection layer (3 and 4) and a light shielding layer (screening film 5 which is made of chromium) successively formed on the transparent substrate (Column 8, Lines 27-32), the anti-reflection layer comprises a first anti-reflection film (3) and a second anti-reflection film (4) *formed on the first antireflection film* and *having a second index of refraction, the first index of refraction being less than the second index of refraction* and a color resin layer (R, G, B).

The first and second anti-reflection films are made of different materials (See Abstract, for example) and thus the films have different indices of refraction.

Please also note that Yoshida teaches: "Consequently, a first antireflection film 3 (that film closer to the transparent substrate side) with a film thickness of 60 nm containing a chromium oxide, chromium nitride, chromium carbide, chromium oxide nitride, chromium oxide carbide, chromium nitride carbide, or chromium oxide nitride carbide was directly formed on the substrate." (Comparative Example, Column 14, Lines 35-67).

Yoshida further states: "Consequently, a second antireflection film 4 with a film thickness of 40 nm containing a chromium oxide, chromium nitride, chromium carbide, chromium oxide nitride, chromium oxide carbide, chromium nitride carbide, or chromium oxide nitride carbide was formed on the first antireflection film 3." (Id.).

Chromium oxide has a smaller index of refraction than that of chromium nitride, for example.

Yoshida teaches that the above antireflection films, in addition to improved contrast, also result in " ... a black mask having reflective characteristics largely exceeding the reflective characteristics of conventional black masks, having small wavelength dependence of the reflectivity overall the visible wavelength range, and being good in its etching characteristics, and a color filter and a liquid crystal display which can provide clear pictures." (Column 16, Lines 1-15).

The black matrix of Yoshida also appears to have apertures and the apertures are filled with the color resin layer as shown in Figure 2.

Yoshida also shows in Figure 3, a liquid crystal layer (22) in between substrates (color filter substrate 1 and TFT substrate 24).

Yoshida, however, does not appear to explicitly that the color resin layer covers the black matrix entirely.

Takizawa teaches and discloses a color filter substrate and associated method and shows in reference to Figure 1, reflective light-shielding layers (212B) with apertures, red (213r) and blue (213b) resin layers that completely cover the light shielding layers (212B) and blue and

green resin layers (213b and 213g) that are stacked above the light shielding layers (212B). Thus, at least one color totally covers the light shielding layers.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Yoshida in view of Takizawa to sufficiently shield light and to prevent degradation of visibility due to light reflected at the light-shielding layers (Column 9, Lines 48-64).

Thus, claim 9 is rejected.

As to claim 10 (amended), Yoshida has a black mask, color filter and liquid crystal display comprising in Figure 2, a transparent substrate (2), a black matrix (BM) having an anti-reflection layer (3 and 4) and a light shielding layer (screening film 5 which is made of chromium) successively formed on the transparent substrate (Column 8, Lines 27-32), the anti-reflection layer comprises a first anti-reflection film (3) and a second anti-reflection film (4) and a color resin layer (R, G, B).

The black matrix *being divided into a plurality of units* ... *the antireflection layer comprising a first antireflection film having a first index of refraction, and a second antireflection film formed on the first antireflection film and having a second index of refraction, the first index of refraction being less than the second index of refraction* ...

The first and second anti-reflection films are made of different materials (See Abstract, for example) and thus the films have different indices of refraction.

Please also note that Yoshida teaches: "Consequently, a first antireflection film 3 (that film closer to the transparent substrate side) with a film thickness of 60 nm containing a chromium oxide, chromium nitride, chromium carbide, chromium oxide nitride, chromium

oxide carbide, chromium nitride carbide, or chromium oxide nitride carbide was directly formed on the substrate." (Comparative Example, Column 14, Lines 35-67).

Yoshida further states: "Consequently, a second antireflection film 4 with a film thickness of 40 nm containing a chromium oxide, chromium nitride, chromium carbide, chromium oxide nitride, chromium oxide carbide, chromium nitride carbide, or chromium oxide nitride carbide was formed on the first antireflection film 3." (Id.).

Chromium oxide has a smaller index of refraction than that of chromium nitride, for example.

Yoshida teaches that the above antireflection films, in addition to improved contrast, also result in " ... a black mask having reflective characteristics largely exceeding the reflective characteristics of conventional black masks, having small wavelength dependence of the reflectivity overall the visible wavelength range, and being good in its etching characteristics, and a color filter and a liquid crystal display which can provide clear pictures." (Column 16, Lines 1-15).

The black matrix of Yoshida also appears to have apertures and the apertures are filled with the color resin layer as shown in Figure 2.

Yoshida, however, does not appear to explicitly specify that portions of the black matrix are completely vertically covered by at least one of said RGB resins.

Takizawa teaches and discloses a color filter substrate and associated method and shows in reference to Figure 1, reflective light-shielding layers (212B) with apertures, red (213r) and blue (213b) resin layers that completely cover the light shielding layers (212B) and blue and

green resin layers (213b and 213g) that are stacked above the light shielding layers (212B). Thus, at least one color totally vertically covers portions of the light shielding layers.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Yoshida in view of Takizawa to sufficiently shield light and to prevent degradation of visibility due to light reflected at the light-shielding layers (Column 9, Lines 48-64).

Thus, claim 10 is rejected.

Response to Arguments

Applicant's arguments filed November 23, 2005 have been fully considered but they are not persuasive.

In sum, Applicant argues that the Yoshida reference does not teach or suggest the feature of the first antireflection film having a smaller index of refraction than that of the second antireflection film.

However, the Yoshida reference does teach a list of preferred materials for the antireflection films. Most notably, Yoshida teaches:

"Consequently, a first antireflection film 3 (that film closer to the transparent substrate side) with a film thickness of 60 nm containing a *chromium oxide, chromium nitride, chromium carbide, chromium oxide nitride, chromium oxide carbide, chromium nitride carbide, or chromium oxide nitride carbide was directly formed on the substrate.*" (Comparative Example, Column 14, Lines 35-67)(emphasis added).

Yoshida further states: "Consequently, a second antireflection film 4 with a film thickness of 40 nm containing a *chromium oxide, chromium nitride, chromium carbide, chromium oxide nitride, chromium oxide carbide, chromium nitride carbide, or chromium oxide nitride carbide was formed on the first antireflection film 3.*" (Id.)(emphasis added).

Chromium oxide has a smaller index of refraction than that of chromium nitride, for example.

These materials are the same materials that Applicant cites as preferred materials for Applicant's antireflection films. See Specification at [0019] pages 4-5.

Yoshida teaches that the above antireflection films, in addition to improved contrast, also result in " ... a black mask having reflective characteristics largely exceeding the reflective characteristics of conventional black masks, having small wavelength dependence of the reflectivity overall the visible wavelength range, and being good in its etching characteristics, and a color filter and a liquid crystal display which can provide clear pictures." (Column 16, Lines 1-15).

One of ordinary skill in the art would have been motivated, based on the examples and teachings of Yoshida to optimize the arrangement of materials for the antireflection films not only for improved contrast but also for the previously noted reasons (See above).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

United States Patent Application US 2003/0063241 A1 (to Matsumoto et al.)(describing a black matrix as a composite of a high reflection film and a low reflection film).

United States Patent 6,469,758 B2 (to Yu)(describing a color filter with first light shielding layer and second light shielding layer formed of a metal oxide and a metal nitride).

United States Patent 5,976,639 (to Iwata)(describing a black matrix laminated film).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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